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COMETS OF 1899.

Five comets in all were discovered during 1899. Of these two only were new, the remaining three being apparitions of short-period comets.

Comet *a* (1899 I) was discovered on March 3, 1899, by Dr. SWIFT, at the Lowe Observatory, Echo Mountain, California. At the time of discovery the comet was moving north and towards the Sun, which it passed on April 12th. During some weeks it was lost while near the Sun, but was picked up again early in May. It attained a north Declination of 57° on May 29th. After perihelion passage, which occurred on April 13th, the comet became much brighter, being estimated at 3.0 magnitude on May 7th (HOLETSCHEK).

On May 11th, a second nucleus was observed, which was visible for two weeks.*

The last observation at Mt. Hamilton was on July 31st.

Comet *b* (1899 III), TUTTLE'S periodic comet, was rediscovered by Dr. MAX WOLF, at Heidelberg, by means of photography, on March 5th. It was then of 12th magnitude. Its brightness increased as it approached perihelion, which was passed on May 4th. It was last observed in the northern hemisphere on May 1st, when it became lost in the rays of the Sun. After perihelion passage it was observed in the southern hemisphere. This comet has a period of 13.8 years, and was observed at its last return in 1885.

Comet *c* (1899 IV), TEMPEL'S second periodic comet, was rediscovered by the writer on May 6th. It was then of about the 16th magnitude, but increased rapidly in brightness as it neared both Sun and Earth. It passed perihelion on July 28th, at which time it was almost in opposition, and only thirty-five million miles distant from the Earth. At this time its brightness was of about the 8th magnitude. This opposition was one of the most favorable possible of this comet. It was last observed at the Lick Observatory on December 1st, when it was of only the 15th magnitude. This comet was observed on its last return to perihelion in 1894.

Comet *d* (1899 II), HOLMES'S periodic comet, was rediscovered by the writer on June 10th. It was then very faint — being estimated at 16th magnitude. This comet attracted much attention at the time of its discovery in 1892, when it was visible to the unaided eye. Its situation was practically as favorable for observation at this appearance as in 1892–93, and yet it has not been brighter than the 14th magnitude.

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* *Publications A. S. P.*, No. 69, p. 150.

Perihelion was passed on April 28th. The last observation at Mt. Hamilton was on December 24th.

Comet *e* (1899 V) was discovered by M. GIACOBINI, at Nice, on September 29th. It was then of about the 11th magnitude. Perihelion was passed on September 15th, at a distance of one hundred and sixty-five million miles. Its brightness has decreased slowly. At the last observation, of December 23d, it was estimated to be of the 13th magnitude. It is now too near the Sun to be observed, but will in all probability be bright enough to be observed with large instruments in February or March. C. D. PERRINE.

1900, January 20.

NOTE ON THE SPECTRUM OF COMET *a* 1899 (SWIFT).

The spectra of the brightest comets of 1898 and 1899 were carefully observed at the Lick Observatory by Mr. WRIGHT. His paper describing the results is published in the *Astrophysical Journal* for October, 1899. One fact established by the observations of SWIFT'S Comet (1899 *a*) seems to me to be of great interest and importance.

Mr. WRIGHT'S photograph of the spectrum records some fifteen bright lines, of which the lines at wave-lengths 4052, 3880, and 3870 are the strongest. "In the spectrum of the nucleus λ 4052 is fully as bright as λ 3870, but the latter line extends out into the comet's head more than four times as far as the former. In fact, the lines λλ 3870 and 3880 experience only a gradual increase in brightness in the region of the nucleus, and extend the entire length of the slit. In the cases of all the other lines, the change is quite abrupt. This must be taken to indicate a marked difference between the spectrum of the nucleus and the spectra of the outer parts of the head."

The lines at λλ 3870 and 3880 are due to cyanogen.

It seems not too much to hope that this beginning in detecting differences in the spectra of different parts of comets may, in the case of very bright comets, be extended over larger areas and in greater detail; leading, as in the case of the Sun, to a better understanding of their condition and constitution. W. W. C.